

Original Article

STUDY OF PREVALENCE OF SCRUB TYPHUS IN ACUTE FEBRILE ILLNESS IN A TERTIARY CARE HOSPITAL, VISAKHAPATNAM

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ABSTRACT

Objective: Re-emergent cases of rickettsial disease, the scrub typhus is seen prevalent in cases of acute febrile illness. The objective of this study was to study the magnitude and prevalence of scrub typhus in a tertiary care hospital.

Methods: This prospective study was carried on for a period of one year from February 2023 to February 2024. Inpatients between the age group of 16 to 25 y with a triad of fever for more than 5 d of onset with or without an eschar, headache, myalgia and abnormal haematological and biochemical parameters were included in the study. IgM ELISA for scrub typhus was performed.

Results: Prevalence of scrub typhus in this study was 9.4% with higher male preponderance of 69.4% in 18 y age group 28.6%. Positive cases were recorded higher during post monsoon season of September 18.9%. Co-infection with dengue and malaria observed in 2 cases and ARDS was the complication in 3 cases. No mortality in this study.

Conclusion: It is important to get familiar with the clinical and diagnostic laboratory findings of scrub typhus so as to differentiate it from other aetiologies of acute febrile illness.

Keywords: Acute febrile illness, Scrub typhus, Prevalence, Eschar, ELISA

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INTRODUCTION

Scrub typhus, vector-borne rickettsial infection, is emerging as an endemic illness [1] with uncertainty of its spread in this sophisticated standards of living conditions. The illness usually manifests as a triad of fever, myalgia and headache [2]. Fever is associated with rash with or without an eschar. Eschar is a necrotic, vesicular lesion seen at the biting site of mite (red chigger, larval form of trombiculid mite) in 7% to 92% of cases. The main reason for low detection of cases is, eschar being missed or overlooked on routine clinical examination as these are painless lesions consisting of a black scab with a erythematous halo and minimal oedema. Clinical presentation ranges from sub-clinical disease to multi-organ failure and death. Serology is the primary investigation of choice. Several tests are available with their own advantages and limitation [3]. Indirect Immunofluorescence test is the gold standard but beyond affordable range; Weil-Felix cheapest but unreliable; IgM ELISA is an economic test, hence opted for this study. Peak incidence was seen in months of September and October. Co-infection with dengue and malaria was seen in 2 cases. ARDS was the complication in this study.

MATERIALS AND METHODS

This prospective study conducted in Virology laboratory, Department of Microbiology, Andhra Medical College, King George Hospital, Visakhapatnam, for a period of 1 y from February 2023 to February 2024.

A total of 507 blood samples were received from Department of General Medicine. Patients between age group of 16 to 25 y, admitted for suspected undiagnosed acute febrile illness with body temperature >99.5 °F, myalgia, headache, rash, vomitings, diarrhoea, diffuse lymphadenopathy, jaundice, dyspnoea were, included in the study.

Laboratory tests performed were complete blood count, renal

function tests, liver function tests, complete urine examination, serum electrolytes, chest X ray (PA), serum calcium, CRP, Procalcitonin, IgM Dengue, WIDAL test, swab for Covid PCR, QBC for MP. Detection of scrub typhus IgM antibodies was done by Scrub Typhus IgM MICROLISA, Microwell ELISA test for the Qualitative detection of Scrub typhus IgM antibodies in human Serum/Plasma by J. Mitra. Cut off value for positive interpretation is >11.0 Scrub Typhus IgM Units.

RESULTS

The total 507 samples received, 49 were tested positive (9.6%) for scrub typhus. Male population was more vulnerable (69.4%) than females (30.6%). Most positivity recorded during months of September (18.9%) and October (13.3%). Percentage of patients positive for scrub typhus was highest in 18 y (28.6%) followed by 22 y (22.4%). 6 patients had a history of tour to remote areas before the onset of illness. 32 were hostelers and others with an unknown aetiology.

Clinical history of fever >99.5°F with chills and rigor (49 cases), myalgia (48 cases), headache (46 cases), rash with eschar (8 cases) and without eschar (14 cases), abdominal pain (7 cases), vomitings (26 cases), diarrhoea (12 cases), dyspnoea (03 cases) were the common clinical presenting symptoms table 1. The mean duration of hospital stay was 10 d, advised for review after 5 d post-discharge.

The laboratory findings were elevated SGOT and SGPT (28 cases), thrombocytopenia (36 cases), hyponatremia (12 cases), hyperkalemia (15 cases), leucopenia (16 cases), metabolic acidosis (18 cases), hypokalemia (19 cases), hyperbilirubinemia (18 cases), hypoalbuminemia (16 cases), hypernatremia (10 cases), elevated blood urea (8 cases), elevated serum creatinine (5 cases), increased serum CRP (46 cases) and procalcitonin (49 cases) levels table 2. Co-infection with dengue and malaria observed in 2 cases and ARDS was the complication in 3 cases.

Table 1: Clinical presentation in scrub typhus cases, n=49

Symptoms and signs	Number of patients (n)	Percentage %
Fever>99.5 °F with chills and rigor	49	100
Rash with an eschar	08	16.3
Rash without an eschar	14	28.6
Abdominal pain	07	14.3
Vomitings	26	53.1
Diarrhoea	12	24.5
Dyspnoea	03	6.1
Headache	46	94
Myalgia	48	98
Jaundice	18	36.7

Table 2: Value of laboratory parameters in scrub typhus cases, n=49

Laboratory parameter	Number of patients (n)	Percentage %
Thrombocytopenia	36	73.5
Elevated SGOT and SGPT	28	57.1
Hyponatremia	12	24.5
Hyperkalemia	15	30.6
Leucopenia	16	32.6
Metabolic Acidosis	18	36.7
Hypokalemia	19	38.7
Hyperbilirubinemia	18	36.7
Hypoalbuminemia	16	32.6
Hypernatremia	10	20.4
Elevated blood urea	08	16.3
Elevated CRP	46	94
Elevated Procalcitonin	49	100
Elevated Serum Creatinine	05	10.2

DISCUSSION

Classically known as the “post-monsoon disease”, seasonal occurrence of scrub typhus may be contributed to changing epidemiological trends of scrub vegetations [4]. Prevalence of scrub typhus in this study is 9.6% [5]. Significant and definitive

exposure was seen in hostelers (65.3%), which is alarming and requires continual monitoring and surveillance of fever cases amongst the younger age group. High seropositivity seen in male patients (69.4%) among 18 y (28.6%) and 22 y (22.4%) table 3. Most cases were recorded during month of September 18.9% table 4.

Table 3: Age-wise distribution of total positive Scrub typhus cases n=49

Age in years	Number of positives (n)	Percentage %
16	05	10.2
17	02	4.1
18	14	28.6
19	03	6.1
20	02	4.1
21	02	4.1
22	11	22.4
23	04	8.1
24	03	6.1
25	03	6.1

Table 4: Monthly distribution of scrub typhus-positive cases

Month	Total tested 507	Total positive 49	Percentage %
February 2023	40	02	5
March 2023	41	02	4.8
April 2023	35	02	5.7
May 2023	27	01	3.7
June 2023	26	03	8.3
July 2023	39	04	10.2
August 2023	45	05	11.1
September 2023	58	11	18.9
October 2023	60	08	13.3
November 2023	45	05	11.1
December 2023	32	03	9.3
January 2024	23	01	4.3
February 2024	26	02	7.6

Hand hygiene personal hygiene [6] practices should be taught and taken care of in colleges and hostels. Scrub typhus triad symptoms was the commonest presentation in this study. Rash with an eschar in this study is 16.3% [7]; rash cases without an eschar (28.6%) might be overlooked for diagnosing scrub typhus, where in serological tests play a vital role in such missed cases [8]. The diagnosis of scrub typhus poses a problem due to low index of suspicion, non-specific signs and symptoms, absence of the specific presentation of an eschar.

Diagnostic modality in this study was IgM ELISA [9], principle being an indirect ELISA. Testing procedure was followed as per the kit protocol. Result were interpreted as positive if the IgM units are >11. No equivocal results in this study.

Kit has sensitivity and specificity as 100% on external evaluation and 100% and 98.58% on in-house evaluation. Kit was stored at 2-8 °C and brought to room temperature 1 h before testing. Pipettes used were calibrated by NABL accredited laboratory. IgM scrub typhus ELISA is only a screening test and will only indicate the presence or absence of scrub typhus antibodies in the specimen. False positive results may be seen in cross-reactions with EBV, Brucella, Dengue virus, which is usually in <1% scenarios.

Patients were treated with oral doxycycline, oral azithromycin, antipyretics, analgesics, intravenous carbapenems in dengue co-infection, combination therapy with oral artesunate and lumefantrine in malaria co-infection, platelet transfusion, electrolyte imbalance corrected, intravenous fluids, supportive therapy for other clinical symptoms.

No mortality recorded in this study [10]. ARDS is recorded in 6.1% cases [11] in this study. Co infection with dengue and malaria cases is recorded in 4.1% cases in this study. General lookout for an eschar facilitates in early diagnosis of scrub typhus. Procalcitonin is the biomarker, which is seen elevated in all the positive cases in this study [12].

CONCLUSION

It is important to get familiar with the clinical and diagnostic laboratory findings of scrub typhus so as to differentiate it from other aetiologies of acute febrile illness. Panel of tests for febrile cases should be designed and done in routinely undertaken [13]. A high index of clinical suspicion should be maintained [14], and an early diagnosis and management is warranted to prevent disease complications and case fatalities [15, 16].

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AUTHORS CONTRIBUTIONS

All authors have contributed equally

CONFLICTS OF INTERESTS

There are no conflicts of interest

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